

EFFECT OF TEMPERATURE GRADIENT ON PARAMETRIC X-RAY RADIATION. STATUS OF EXPERIMENT

*Alpik Mkrtchyan^{a,b}, Artak Mkrtchyan^a,
Alexander Potylitsyn^b, Vahan Kocharyan^{a,b,1},
Valery Nikoghosyan^c, Artem Vukolov^b, Artem Novokshonov^b,
Alexey Gogolev^b, Alexander Wagner^b, Artur Mousisyan^a*

^a Institute of Applied Problems of Physics of NAS RA, Yerevan, Armenia

^b National Research Tomsk Polytechnic University, Tomsk, Russia

^c A. Alikhanian National Laboratory, Yerevan, Armenia

This work is devoted to investigations of PXR which is generated by 20-50 MeV electrons in the X-cut quartz single crystal at the presence of the temperature gradient. For this propose the beam line LEA-50 (YerPhI) has been constructed with the beam spot diameter of 1 mm, the beam energy spread up to 1%, the beam current up to 0.1 μ A.

At the first stage we have investigated X-ray diffraction by the quartz single crystal in Laue geometry influenced by the temperature gradient using the beam of X-ray tube radiation. It has been experimentally shown that intensity of the reflected beam depends on the temperature gradient value and can be increased 2 orders at least. It is shown that by means of the temperature gradient impact it is possible to separate a beam with high angular and spectral width from the white X-ray tube spectrum, to change the direction of reflection and to tune the focus distance.

¹ Corresponding author: vahan2@yandex.ru